

Introduction

- The CoVID-19 pandemic challenged our healthcare system to efficiently utilize resources and maximize patient outcomes.
- Treatment of cardiogenic shock (CS) may involve mechanical ventilation, pacemaker implantation, intra-aortic balloon pump, or Impella heart pump.
- Appropriate use of resources is a critical aspect of treatment of cardiogenic shock, especially during the global pandemic.

Study Question

Does resource utilization and outcome differ among patients with cardiogenic shock based on CoVID-19 infection status?

Data Methods

- Retrospective analysis of discharge data from the National In-patient Sample of January - December 2020
- Patients with ages ≥ 18 years diagnosed with coronavirus disease-19 (CoVID-19) and cardiogenic shock (CS) were identified using ICD-10-CM codes (U07.1 and R57.0, respectively).
- Resource utilization includes mechanical ventilation, implantation of a pacemaker, Impella, and Intra-Aortic Balloon Pump (IABP).
- Pre-specified outcomes of interest were hospitalization length, total hospitalization cost, and all-cause in-patient mortality.
- Stepwise regression analysis that adjusted for age, race, sex, and comorbidities (obesity, dyslipidemia, acute and chronic kidney disease, hypertension, pulmonary hypertension, coronary artery disease, valvular heart disease, atrial fibrillation, heart failure, and Charlson Comorbidity Index) was used to determine the impact of CoVID-19 in CS.

Results

No difference between groups

- Utilization of mechanical ventilation | adjusted odds ratio [aOR]: 0.99, 95% CI: 0.89-1.1, $p=0.846$

Patients with CoVID-19 and CS had reduced odds of:

- Intra-Aortic Balloon Pump Use | aOR: 0.42, 95% CI: 0.34-0.54, $p<0.001$
- Impella Use | aOR: 0.34, 95% CI: 0.23-0.5, $p<0.001$
- Pacemaker Implantation | aOR: 0.31, 95% CI: 0.21-0.45, $p<0.001$

Patients with CoVID-19 and CS had increased:

- Hospital stay by 3.2 ± 0.4 days | ($p<0.001$)
- Cost of hospital stay by $34,923 \pm 10,995$ US dollars ($p=0.002$)
- In-hospital mortality (aOR: 3.09, 95% CI: 2.78-3.43, $p<0.001$).



Discussion

- Patients hospitalized for CoVID-19 and CS had a reduced chance of receiving mechanical circulatory support, more extended hospital stays, higher hospitalization charges, and increased odds of in-hospital mortality.
- In the US, there are still 15,000 - 20,000 hospitalizations for CoVID-19 a week in September 2023, CoVID-19 still impacts many communities and healthcare systems.
- The overall annual cost of treating CS exceeds \$65 million in the United States
- By recognizing the increased cost of treatment and resource utilization in patients with both CoVID-19 and CS, we will be able to better prepare for future CoVID-19 resurgences and future pandemics.
- Future studies may also be important to demonstrate the ongoing effect of the CoVID-19 on healthcare in order to shape future responses to global pandemics

References

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